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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,629	02/15/2001	David D. Wu	2000.032100/TT3633	2717

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EXAMINER

CAO, PHAT X

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,629

Applicant(s)

WU ET AL.

Examiner

Phat X. Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 21-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,7,10,11,14,17,20 and 47 is/are rejected.
- 7) ☒ Claim(s) 2,3,5,6,8,9,12,13,15,16,18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. In view of the Appeal Brief filed on 4/1/03, PROSECUTION IS HEREBY REOPENED.

The new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
- (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes

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of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1, 7, 11, 17 and 47 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu (US. 6,255,175).

With respect to claim 1, Yu (Fig. 4) discloses a method comprising: forming a gate dielectric 208 above a surface of the substrate 102; forming a doped-poly gate structure 206 above the gate dielectric, the doped-poly gate structure 206 having an edge region; and forming a first dopant-depleted region 232 or 234 in the edge region of the doped-poly gate structure adjacent the gate dielectric and a second dopant-depleted region 212 in the substrate 102 under the edge region of the doped-poly gate structure 206.

With respect to claim 11, Yu (Figs. 4-6) discloses a method comprising: forming a gate dielectric 208 above a surface of a substrate 102; forming a doped-poly gate structure 206 above the gate dielectric, the doped-poly gate structure 206 having an edge region; forming a source/drain extension 252 adjacent the doped-poly gate structure; and forming a dopant-depleted poly region 232 in the edge region of the doped-poly gate structure adjacent the gate dielectric and a dopant-depleted-SDE region 212 in the substrate 102 under the edge region of the doped-poly gate structure 206.

With respect to claim 47, Yu (Fig. 4) discloses a method, comprising: forming a gate dielectric 208 above a surface of a semiconductor substrate 102; forming a doped-poly gate structure 206 above the gate dielectric, the doped-poly gate structure 206 having an edge region; and forming a first dopant-depleted region 232 in the edge region of the doped-poly gate

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structure adjacent the gate dielectric and a second dopant-depleted region 212 in the substrate 102 under the edge region of the doped-poly gate structure 206 by: implanting a counter-dopant into the edge region of the doped-poly gate structure adjacent the gate dielectric and implanting a dopant into the top surface of the substrate 102; and forming depleting dielectric spacers 240 adjacent the doped-poly gate structure.

With respect to claims 7 and 17, Yu (Fig. 5) further discloses depleting the edge region of the doped-poly gate structure 206 adjacent the gate dielectric and depleting the substrate 102 under the edge region of the doped-poly gate structure 206 by forming the depleting dielectric spacers 240.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 10, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (US. 6,255,175) in view of Thompson et al (US. 6,020,244).

With respect to claims 4 and 14, Yu does not disclose the using of a photoresist mask for forming the source/drain extension 212.

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However, Thompson (Fig. 3 and column 3, lines 18-42) teaches the using of a photoresist mask 33 for forming the source/drain extension. Accordingly, it would have been obvious to use the photoresist mask for forming the source/drain extension because it is a known process for defining the source/drain extension under the edge region of the gate, as taught by Thompson (Fig. 3).

With respect to claims 10 and 20, Yu further discloses that the depth of the first dopant-depleted region from the edge of the gate can be optimized by controlling the implantation energy and the dose of the counter dopant in the larger angle tilt implantation process (column 5, lines 34-42). Accordingly, in view of the teachings of Yu, it would have been obvious to provide a depth of the first dopant-depleted region from the edge of the gate in the range as claimed by controlling the implantation energy and the dose of the counter dopant because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

6. Claims 2-3, 5-6, 8-9, 12-13, 15-16, and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to disclose the combination of a method of forming a semiconductor device structure including the forming the first dopant depleted region including implanting a

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counter dopant into the edge region of the doped poly gate structure, and forming the second dopant depleted region including implanting the counter dopant into the substrate under the edge region of the doped poly gate structure.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 4, 7, 10-11, 14, 17, 20, and 47 have been considered but are moot in view of the new ground(s) of rejection.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

PC
June 13, 2003


PHAT X. CAO
PRIMARY EXAMINER